

## BELLEFONTE AREA SCHOOL DISTRICT GRADE 3 MATHEMATICS LEARNING OBJECTIVES

### **2.1 Numbers, Number Systems and Number Relationships**

*By the end of the school year, third grade students should be able to:*

**1. Demonstrate an understanding of the use of numbers by:**

- Reading and writing whole numbers up to 1,000,000.
- Reading, writing, and modeling, with manipulatives, decimals through hundredths and identifying places in numbers and the values of digits.
- Translating between whole numbers and decimals represented in words, in base-10 notation.
- Reading, writing and modeling fractions.
- Solving problems involving fractional parts of a region or a collection.
- Finding multiples of 2, 5, and 10.

**2. Demonstrate an understanding of ways to represent numbers by:**

- Using numerical expressions involving one or more of the basic four arithmetic operations to give equivalent names for whole numbers.
- Using manipulatives and drawings to find and represent equivalent names for fractions.
- Using manipulatives to generate equivalent fractions.

**3. Demonstrate an understanding of number relationships by:**

- Comparing and ordering whole numbers up to 1,000,000.
- Using manipulatives to order decimals through hundredths.
- Using area models and benchmark fractions to compare and order fractions.

### **2.2 Computation and Estimation**

*By the end of the school year, third grade students should be able to:*

**1. Compute accurately by:**

- Demonstrating automaticity with all addition and subtraction facts through  $10 + 10$ .
- Using basic facts to compute fact extensions such as  $80 + 70$ .
- Using manipulatives, mental arithmetic, paper-and-pencil algorithms, and calculators to solve problems involving the addition and subtraction of whole numbers and decimals in a money context.
- Demonstrating automaticity with  $\times 0$ ,  $\times 1$ ,  $\times 2$ ,  $\times 5$ , and  $\times 10$  multiplication facts.
- Using strategies to compute facts up to  $10 \times 10$ .
- Using arrays, mental arithmetic, paper-and-pencil algorithms, and calculators to solve problems involving the multiplication of 2- and 3-digit whole numbers by 1-digit whole numbers.

**2. Make reasonable estimates by:**

- Making reasonable estimates for whole number addition and subtraction problems; explaining how the estimates were obtained.

**3. Demonstrate an understanding of the meanings of operations by:**

- Recognizing and describing change, comparison, and parts-and-total situations.
- Using repeated addition, arrays, and skip counting to model multiplication.
- Using equal sharing and equal grouping to model division.

## **2.3 Measurement and Estimation**

*By the end of the school year, third grade students should be able to:*

### **1. Measure accurately by:**

- Estimating length (with and without the use of tools).
- Measuring length to the nearest  $\frac{1}{2}$  inch &  $\frac{1}{2}$  centimeter.
- Drawing and describing angles as records of rotations.
- Describing and using strategies to measure the perimeter of polygons.
- Counting unit squares to find the areas of rectangles.
- Describing relationships among inches, feet, and yards.
- Describing relationships between minutes in an hour, hours in a day, days in a week.

### **2. Use reference frames (i.e. clocks, thermometers) by:**

- Telling and showing time to the nearest minute on an analog clock.
- Telling and writing time in digital notation.

## **2.6 Statistics and Data Analysis & 2.7 Probability and Predictions**

*By the end of the school year, third grade students should be able to:*

### **1. Select and create graphs using data by:**

- Collecting and organizing data or using given data to create charts, tables, bar graphs, and line plots.

### **2. Analyze and interpret data by:**

- Using graphs to ask and answer simple questions and draw conclusions.
- Finding the maximum, minimum, mode, and median of a data set.

### **3. Demonstrate an understanding of probability by:**

- Describing events using basic probability terms (e.g. certain, very likely, likely, unlikely, very unlikely, impossible).
- Predicting the outcome of simple experiments and testing predictions using manipulatives.
- Expressing the probability of an event by using “\_ out of \_” language.

## **2.8 Algebra and Functions, 2.10 Trigonometry, & 2.11 Calculus**

*By the end of the school year, third grade students should be able to:*

### **1. Demonstrate an understanding of patterns and functions by:**

- Extending, describing and creating numeric patterns; describing rules for patterns and using them to solve problems; using words and symbols to describe and write rules for functions involving addition, subtraction, and multiplication and using those rules to solve problems.

### **2. Use symbols to represent and analyze situations by:**

- Reading, writing and explaining number sentences using the symbols +, -,  $\times$ ,  $\div$ , =, > and <.
- Solving number sentences; writing expressions and number sentences to model number stories.
- Recognizing that numeric expressions can have different values depending on the order in which operations are carried out; understanding that grouping symbols can be used to affect the order in which operations are carried out.
- Describing and applying the Commutative & Associative Properties of Addition, the Commutative Property of Multiplication, and the Multiplicative Identity.

## **2.9 Geometry**

*By the end of the school year, third grade students should be able to:*

### **1. Demonstrate an understanding of 2- and 3- dimensional shapes by:**

- Identifying and drawing points, intersecting and parallel line segments and lines, rays, and right angles.
- Identifying, describing, modeling and comparing plane and solid figures (e.g. circles, polygons, spheres, cylinders, rectangular prisms, pyramids, cones, and cubes) using appropriate geometric terms (e.g. face, edge, vertex, and base).

### **2. Apply transformations and symmetry by:**

- Creating and completing 2-dimensional symmetric shapes or designs.
- Locating multiple lines of symmetry in a 2-dimensional shape.